# DDFA Small Business Innovative Research Program Highlights

**DDFA&SCFA Mid-Year Review**

**Vijendra Kothari**

**March 5-7, 2002**

# Overview

- Established in 1982 under the Small Business Innovation Development Act
- SBIR programs fund R&D efforts of a high-risk nature
- In December 2000, the SBIR Program was re-authorized until September 30, 2008

# Objectives

- stimulate technological innovation
- use small business to meet R&D needs
- encourage the participation by disadvantaged and minority persons
- to increase private sector commercialization derived from federal R&D

# Process

- **Phase I : To evaluate merit and feasibility**
- **Phase II: The principal R&D effort**
- **Phase III:**

# Phase I Awards

**Radiation Monitoring Devices, Inc.**, *A High Sensitivity Beta Imaging System for Surface Assessment*

**YAHSGS LLC/Oak Ridge National Lab**, *Total Online Access Data System*

**Aspen Systems, Inc.**, *Personal Cooling System*

**Physical Optics Corporation**, *An Advanced Real-Time Data Management System*

# Radiation Monitoring Devices, Inc.

## *A High Sensitivity Beta Imaging System for Surface Assessment*

**Objective** - To demonstrate the feasibility of developing a high throughput, high sensitivity, imaging instrument for measuring levels and distribution of tritium contamination.

**Final Result** - Will be the experimental verification of a multi-element APD instrument for beta imaging and the preliminary design of a Phase II prototype system.

# YAHSGS LLC/Oak Ridge National Lab

## *Total Online Access Data System*

**Objective** - Demonstrate the feasibility of

(1) transferring data from an existing Department of Energy environmental database into a prototype surveillance and maintenance data management system,

(2) transmitting data from a wide variety of surveillance and maintenance field-based instruments, and

(3) using a novel hemispheric visual immersion technology in a remote field situation for historical documentation.

# Aspen Systems, Inc.

## *Personal Cooling System*

**Objective** - To design and build a system to replace the current ice block and pumping unit cooling systems with a miniature vapor compression system.

**Final Result** - The product will allow D&D activities to proceed more efficiently, thus reducing cost and time to complete environmental restoration.

# Physical Optics Corporation

## *An Advanced Real-Time Data Management System*

**Objective** - To develop an improved data characterization and management system to facilitate long-term surveillance and maintenance and planning for final disposition of contaminated sites and facilities. To meet this need , a novel Advanced Real-Time Data Management System (ARTDMS) will be developed.

# Phase II Awards

**ARM Automation, Inc.,** *Modular Robotics for Delivering On-Site Contamination Sensors and Mapping System to Difficult-to-Access Locations*

**AUTOMITIKA, Inc.,** *PipeTaz: Automated Pipe Asbestos Insulation Removal System*

**ADA Technologies, Inc.,** *Portable Multicontaminant Detection Instrumentation for R&D*

# ARM Automation, Inc.

## Objectives

**Provide a remote means to characterize hazardous radiological surface contamination**

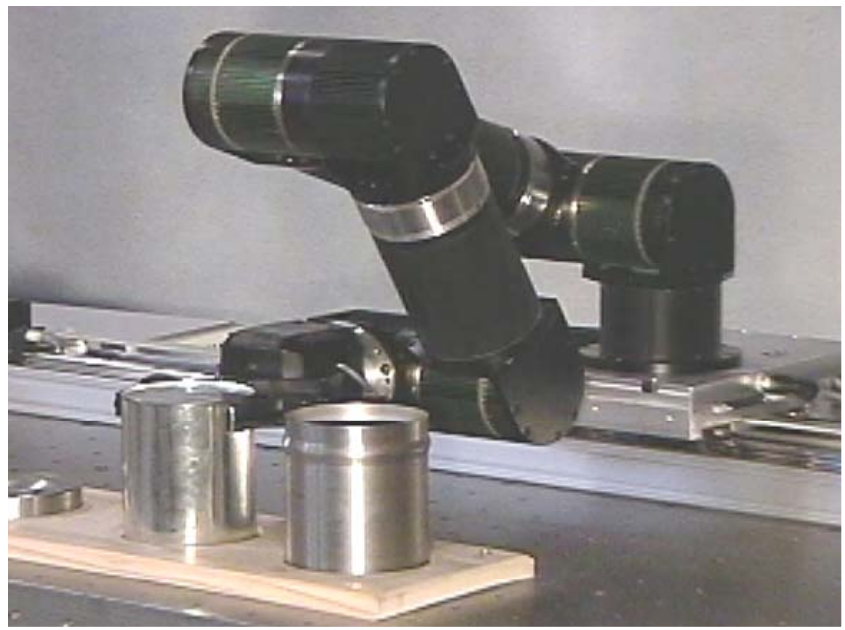
- **Without worker entry and exposure**
- **By integrating modular robotics and real-time contamination sensing into a pushcart-sized mobile unit**
  - **Delivering sensors into difficult-to-access areas via a long-reach, dexterous robotic arm.**
  - **Recording contamination information**

# ARM Automation, Inc.

## *Modular Robotics for Delivering On-Site Contamination Sensors and Mapping System to Difficult-to-Access Locations*

Features:

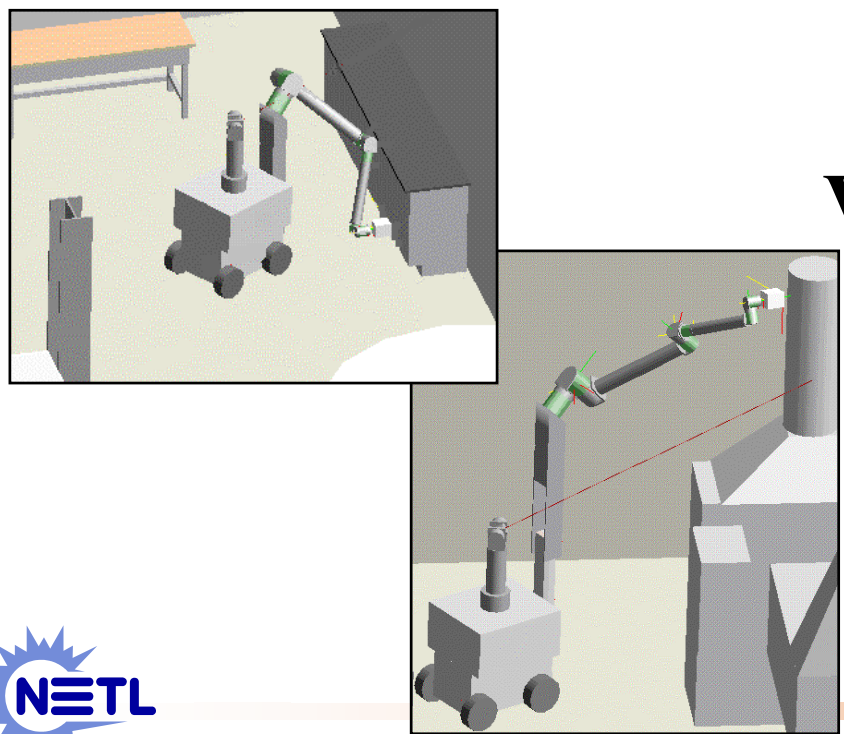
- Real-time, remote radiation measurement
- Allows for direct surface measurements
- Mobile (passes through standard doorways)
- Can reach along high walls and ceilings or into hazardous locations
- Manual designation/Automatic execution of measurements
- Graphical "map" of contamination measurement locations
- System has many alternative remote characterization uses



# ARM Automation, Inc.

## Benefits

- Reduces or eliminates worker exposure
- Reduces time
- Reduces cost



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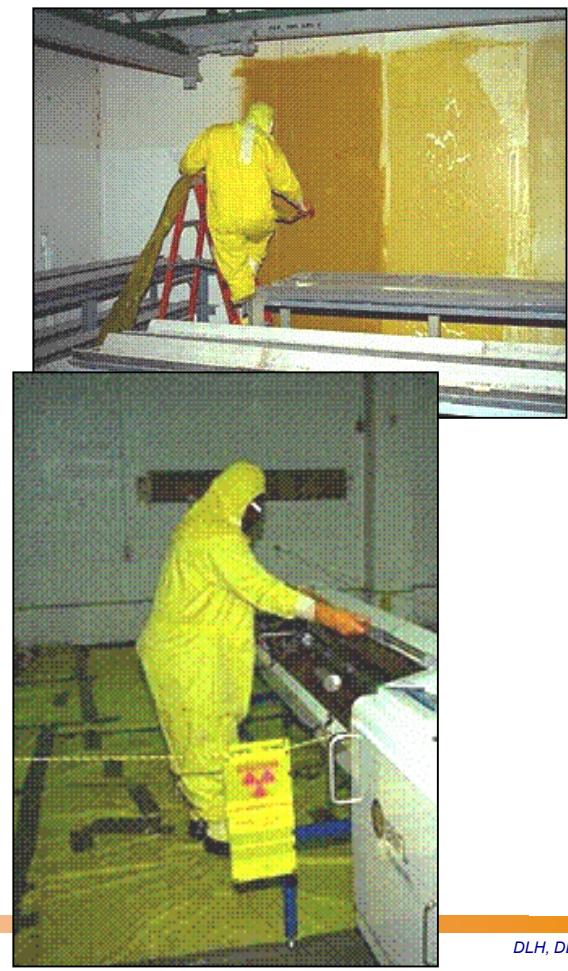

# ARM Automation, Inc.

## Status

- Selection of Berkeley Nucleonics to Provide Sensor Technology
- Cart System and Subsystem Specification, Procurement, Building, and Testing
- Robotic Arm Refinement will Continue

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# Objectives

**To build an in-situ asbestos abatement system designed to:**

- **reduce the personnel required to abate asbestos from wrap-and-cut piping**
- **increase the speed at which asbestos insulation can be removed**
- **allow the cleaned pipe to be recycled**
- **reduce the volume and weight of asbestos-contaminated waste.**

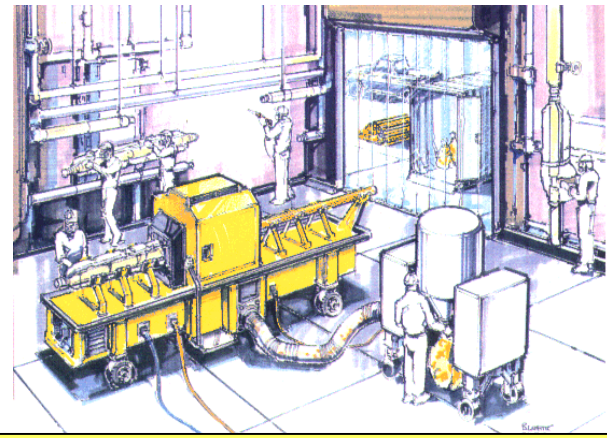
# Automatika

## *PipeTaz: In-situ pipe-insulation abatement system for wrap-and-cut DOE process piping*

**Features:**

- Handles 4 to 18 inch pipe with up to 2-inch thick insulation with any type of insulation and/or cladding
- Compliant with OSHA & EPA regs
- Controlled waste- & fiber-containment & emissions & alarm system
- Easily to transport & set up
- Push-button single-operator control
- Pipe encapsulation for recycling & double-bagging of waste

CONCEPT



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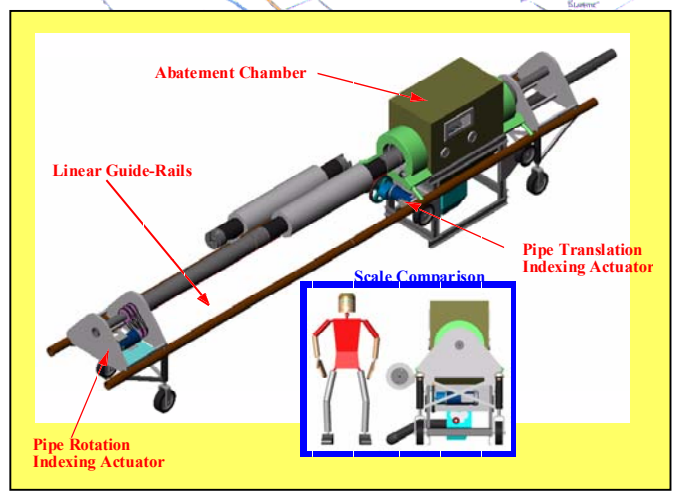


WASTE

CUTTER

# Benefits

- Cost reduction of thermal piping insulation abatement thru:
  - Separation of recyclable pipe from disposable/treatable waste
  - Reduced disposal/treatment waste-volume (by up to 90%)
  - Savings over conventional abatement methods (<50%; estimated to save up to $80M)
- Also applicable to industrial abatement market due to larger (10x) market-size

# Automatika

## Status

- Status – 6 months into Phase II (Feb.'02)
  - System Cutter Subsystem Design completed & undergoing testing
- Schedule
  - System design completed by May 2002 with NIBS & IUOE Design Review
  - Prototype built and undergoing testing by Jan.'03
  - Industrial partner field-trials by Jun.'03


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# ADA Technologies, Inc.

# Objective

- Prototype Instruments Design and Build
- Deployed at D&D Operations
- Design Variants to Broaden the Market and Promote Commercialization

# ADA Technologies, Inc.

## *Portable Multicontaminant Detection Instrumentation for R&D*

# ADA Technologies, Inc.

# Benefits

- "Snooping" Ability
- Faster, Lower Cost, and Safer
- Commercialization

# ADA Technologies, Inc.

## Status

- Beryllium field test was highly successful
- Identified and purchased higher power/repetition rate laser, necessary detectors, and spectrometers
- Identified radiation sensor system
- Nearing completion of even smaller sample wand design (DIAL)

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# Summary

- The SBIR projects are well integrated in DDFA activities.
- These project will help bring innovative technologies to the DOE and the commercial industry to reduce costs, accelerate work schedules, and reduce worker exposure to hazardous conditions.